window frame, duct, plumbing, piping, or hanger, for example. The optical sensing can be performed by an optical vibration sensor (OVS) that can be a laser vibrometer, for example. The determination of whether a fault exists in the structure can be performed by a computer and/or a human operator.

Page 10, Paragraph 3, please delete and replace with the following:

"Structure element" can be a foundation, roof, ceiling, floor, wall, beam, column, support, joist, wall, wall panel such as dry wall, wall frame, window, window frame, duct, plumbing, piping, hangers, or other element used in the construction or renovation of a building, house, or other structure.

In the Claims

Please CANCEL Claims 11, 12, 16-23, 66, 73 without prejudice.

Please AMEND Claims 1-4, 14, 25, 27, 29, 31, 57, 59, 61, and 63 as follows:

1. (Once Amended) A method comprising the steps of:

a) vibrating ground in proximity to a structure resting on the ground to produce vibration in the structure, the structure being a house or building;

b) optically sensing vibration from the structure without contacting the structure; and

c) determining whether a fault exists in the structure, based on the optically-sensed vibration.

2. (Once Amended) A method as claimed in claim 1 wherein the step (b) comprises substeps of:

b1) generating and transmitting a laser beam to the structure;

b2) receiving the laser beam from the structure;

b3) detecting Doppler shift in the received laser beam relative to the transmitted laser beam; and

b4) determining at least one of the peak displacement and velocity of the vibration, based on the detecting of the substep (b3).

3. (Once Amended) A method as claimed in claim 1 wherein the sensing of the step (b) is performed by sensing peak displacement of the vibration from at least one portion of the structure.

4. (Once Amended) A method as claimed in claim 1 wherein the sensing of the step (b) is performed by sensing peak velocity of the vibration from at least one portion of the structure.

5. (Once Amended) A method as claimed in claim 1 wherein the sensing of the step (b) comprises optically sensing vibrations from different portions of the structure corresponding to similar elements of the structure, the method further comprising:

d) comparing the vibrations from the different portions of the structure; and

the determining of step (c) performed based on the result of the comparing of the step (d).

6. (Once Amended) A method as claimed in claim 5 wherein the comparing of the step (d) is performed based on peak displacement of the vibrations.

7. (Once Amended) A method as claimed in claim 5 wherein the comparing of the step (d) is performed based on peak velocity of the vibrations.

8. (Once Amended) A method as claimed in claim 1 wherein the step (b) is performed with a laser vibrometer.

9. (Once Amended) A method as claimed in claim 1 wherein the step (b) is performed with a Doppler laser vibrometer.

10. (Once Amended) A method as claimed in claim 1 wherein step (c) is performed with a computer.

13. (Once Amended) A method as claimed in claim 1 wherein the step (c) comprises driving a vehicle over spaced objects to vibrate the structure.

14. (Once Amended) A method as claimed in claim 1 wherein the step (c) comprises vibrating the ground with a ground vibrator.

15. (Once Amended) A method as claimed in claim 1 wherein the step (c) comprises vibrating the ground by generating an explosion.

24. (Once Amended) A method as claimed in claim 1 wherein the performance of the step (c) determines that the fault exists in the structure, the fault being damage of a structure element.

25. (Once Amended) A method as claimed in claim 24 wherein the structure element comprises at least one of a foundation, roof, ceiling, floor, wall, beam, column, support, joist, wall panel, wall frame, window, window frame, duct, plumbing, piping, or hanger.

26. (Once Amended) A method as claimed in claim 1 wherein the performance of the step (c) determines that the fault exists in the structure, the fault being deterioration of a structure element.

27. (Once Amended) A method as claimed in claim 26 wherein the structure element comprises at least one of a foundation, roof, ceiling, floor, wall, beam, column, support, joist, wall panel, wall frame, window, window frame, duct, plumbing, piping, or hanger.

28. (Once Amended) A method as claimed in claim 1 wherein the performance of the step (c) determines that the fault exists in the structure, the fault being a dislocation or separation between structure elements normally joined.

29. (Once Amended) A method as claimed in claim 28 wherein the structure elements each comprise at least one of a foundation, roof, ceiling, floor, wall, beam, column, support, joist, wall panel, wall frame, window, window frame, duct, plumbing, piping, or hanger.

31. (Once Amended) A method as claimed in claim 30 wherein the structure elements each comprise at least one of a foundation, roof, ceiling, floor, wall, beam, column, support, joist, wall panel, wall frame, window, window frame, duct, plumbing, piping, or hanger.

54. (Once Amended) A method as claimed in claim 32 wherein the structure is a building.

55. (Once Amended) A method as claimed in claim 32 wherein the structure is a house.

56. (Once Amended) A method as claimed in claim 32 wherein the performance of the step (b) determines that the fault exists in the structure, the fault being damage of a structure element.

57. (Once Amended) A method as claimed in claim 56 wherein the structure element comprises at least one of a foundation, roof, ceiling, floor, wall, beam,

column, support, joist, wall panel, wall frame, window, window frame, duct, plumbing, piping, or hanger.

58. (Once Amended) A method as claimed in claim 32 wherein the performance of the step (b) determines that the fault exists in the structure, and the fault is deterioration of a structure element.

59. (Once Amended) A method as claimed in claim 56 wherein the structure element comprises at least one of a foundation, roof, ceiling, floor, wall, beam, column, support, joist, wall panel, wall frame, window, window frame, duct, plumbing, piping, or hanger.

60. (Once Amended) A method as claimed in claim 32 wherein the performance of the step (c) determines that the fault exists in the structure, and the fault is a dislocation or separation between structure elements normally joined.

61. (Once Amended) A method as claimed in claim 60 wherein the structure elements each comprise at least one of a foundation, roof, ceiling, floor, wall, beam, column, support, joist, wall panel, wall frame, window, window frame, duct, plumbing, piping, or hanger.

62. (Once Amended) A method as claimed in claim 32 wherein the performance of the step (c) determines that the fault exists in the structure, and the fault is an improper joining of structure elements.

63. (Once Amended) A method as claimed in claim 62 wherein the structure elements each comprise at least one of a foundation, roof, ceiling, floor, wall, beam, column, support, joist, wall panel, wall frame, window, window frame, duct, plumbing, piping, or hanger.

64. (Once Amended) A system for detecting a fault in a structure, the system for use with a remote computer and a network, the system comprising:

an optical vibration sensor (OVS) positioned in proximity to the structure, the OVS optically sensing vibration of the structure, the OVS generating an OVS signal based on the sensed vibration from the structure, the OVS signal indicating whether the fault exists in the structure; and

a computer coupled to receive the OVS signal, the computer determining whether a fault exists in the structure based on the OVS signal, the

computer generating a computer signal indicating whether the fault exists in the structure,

the computer coupled to supply the computer signal indicating whether a fault exists in the structure to the remote computer via the network.

65. (Once amended) A system as claimed in claim 64 wherein the computer is coupled to receive the OVS signal, the computer generating a display based on the OVS signal, the display used by a human user to determine whether a fault exists in the structure.

75. (Once Amended) A system as claimed in claim 64 further comprising:

an OVS controller (OVSC) coupled to receive the signal from the OVS, the OVSC generating a signal indicating vibration velocity of at least one portion of the structure, the OVSC coupled to supply the signal indicating the vibration velocity to the computer as the OVS signal.

76. (Once Amended) A system as claimed in claim 75 wherein the OVSC is coupled to the OVS, and is operable to automatically focus the OVS on the structure.

R E M A R K S

Status of Claims

In the Office Action, Claims 1-93 were noted as pending in the application. Claims 1-12, 14-44, 46-72, 74-86, and 88-93 were rejected. Claims 13, 45, 73, and 87 were found objectionable due to dependence from a rejected base claim, but were noted to be allowable if rewritten in independent form to include the limitations of the base claim and any intervening claims. Also, the drawings were found objectionable. The rejections and objections, are addressed separately below.

Drawings

On Page 2, Item 1 of the Office Action, the drawings filed on July 12, 2001 were found objectionable due to non-compliance of the margins of Figures 7B and 7F with MPEP 608.02(g). By separate Letter to the Examiner, approval of changes to the margins of Fig. 7B and 7F is requested to overcome the objection. Approval of the requested drawing changes and withdrawal of the objection are requested.